

CLAIMS

That which is claimed:

1. A method of operating an electronic device, comprising:
receiving a noise signal;
generating a sound metric for the noise signal; and
generating an alert signal based on the sound metric.
2. The method of Claim 1, wherein generating the alert signal comprises:
generating the alert signal having a spectral composition that is based on the sound metric.
3. The method of Claim 2, wherein the sound metric is a loudness profile and wherein generating the sound metric comprises:
performing a Fourier transform on the noise signal to obtain a frequency domain representation of the noise signal.
4. The method of Claim 3, wherein generating the sound metric further comprises:
calculating a distribution of sones/bark versus bark for the frequency domain representation of the noise signal using an ISO 532B loudness calculation method; and
determining an overall loudness for the noise signal and a loudness in at least one critical band for the noise signal based on the distribution of sones/bark versus bark, the loudness profile comprising the overall loudness of the noise signal and the loudness in at least one critical band.
5. The method of Claim 4, wherein generating the alert signal comprises:
determining a power value for the alert signal based on the loudness profile for the noise signal;
determining a transfer function for an alert signal transmit filter based on the loudness profile for the noise signal; and

transmitting the alert signal at the power value using the alert signal transmit filter.

6. The method of Claim 5, wherein determining the transfer function for
5 the alert signal transmit filter comprises:
selecting coefficients for the alert signal transmit filter.

7. The method of Claim 1, wherein the sound metric comprises a
loudness profile and/or a sharpness profile.

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8. The method of Claim 1, further comprising:
receiving an incoming communication and/or scheduled event at the electronic
device; and
wherein receiving the noise signal comprises receiving the noise signal
15 responsive to receiving the incoming communication.

9. The method of Claim 1, further comprising:
receiving an incoming communication at the electronic device after receiving
the noise signal and generating the sound metric for the noise signal; and
20 wherein generating the alert signal comprises generating the alert signal having
the spectral composition that is based on the sound metric responsive to receiving the
incoming communication.

10. The method of Claim 1, wherein the electronic device is a mobile
25 terminal.

11. A method of operating an electronic device, comprising:
providing a plurality of alert profiles;
receiving a user selection of one of the plurality of alert profiles; and
30 generating an alert signal that is based on the selected one of the plurality of
alert profiles.

12. The method of Claim 11, wherein generating the alert signal comprises generating the alert signal having a spectral composition that is based on the selected one of the plurality of alert profiles.

5 13. The method of Claim 11, wherein generating the alert signal comprises:

determining a power value for the alert signal based on the selected one of the plurality of alert profiles for the noise signal;

10 determining a transfer function for an alert signal transmit filter the selected one of the plurality of alert profiles for the noise signal; and

transmitting the alert signal at the power value using the alert signal transmit filter.

14. A method of operating an electronic device, comprising:

15 providing a plurality of alert profiles; then

receiving a noise signal;

selecting one of the plurality of alert profiles responsive to receiving the noise signal; and

20 generating an alert signal that is based on the selected one of the plurality of alert profiles.

15. The method of Claim 14, wherein generating the alert signal comprises generating the alert signal having a spectral composition that is based on the selected one of the plurality of alert profiles.

25 16. The method of Claim 14, wherein generating the alert signal comprises:

determining a power value for the alert signal based on the selected one of the plurality of alert profiles for the noise signal;

30 determining a transfer function for an alert signal transmit filter the selected one of the plurality of alert profiles for the noise signal; and

transmitting the alert signal at the power value using the alert signal transmit filter.

17. An electronic device, comprising:
a receiver that is configured to receive a noise signal;
a sound metric processor that is configured to generate a sound metric for the
5 noise signal; and
an alert generator that is configured to generate an alert signal that is based on
the sound metric.

18. The electronic device of Claim 17, where the alert generator is further
10 configured to generate an alert signal having a spectral composition that is based on
the sound metric.

19. The electronic device of Claim 18, wherein the sound metric is a
loudness profile and wherein the electronic device further comprises:
15 a Fourier transform module that is configured to obtain a frequency domain
representation of the noise signal.

20. The electronic device of Claim 19, wherein the sound metric processor
is further configured to calculate a distribution of sones/bark versus bark for the
20 frequency domain representation of the noise signal using an ISO 532B loudness
calculation method and to determine an overall loudness for the noise signal and a
loudness in at least one critical band for the noise signal based on the distribution of
sones/bark versus bark, the loudness profile comprising the overall loudness of the
noise signal and the loudness in at least one critical band.

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21. The electronic device of Claim 20 wherein the alert generator further
comprises an alert signal transmit filter and wherein the alert generator is further
configured to determine a power value for the alert signal based on the loudness
profile for the noise signal, determine a transfer function for the alert signal transmit
30 filter based on the loudness profile for the noise signal, and transmit the alert signal at
the power value using the alert signal transmit filter.

22. The electronic device of Claim 21, wherein the alert generator is further configured to select coefficients for the alert signal transmit filter.

23. The electronic device of Claim 17, wherein the sound metric comprises
5 a loudness profile and a sharpness profile.

24. The electronic device of Claim 17, wherein the electronic device is a mobile terminal.

10 25. An electronic device, comprising:
means for receiving a noise signal;
means for generating a sound metric for the noise signal; and
means for generating an alert signal based on the sound metric.

15 26 The electronic device Claim 25, wherein the means for generating the alert signal comprises:
means for generating the alert signal having a spectral composition that is based on the sound metric.

20 27. The electronic device of Claim 26, wherein the sound metric is a loudness profile and wherein the means for generating the sound metric comprises:
means for performing a Fourier transform on the noise signal to obtain a frequency domain representation of the noise signal.

25 28. The electronic device of Claim 27, wherein the means for generating the sound metric further comprises:

means for calculating a distribution of sones/bark versus bark for the frequency domain representation of the noise signal using an ISO 532B loudness calculation method; and
30 means for determining an overall loudness for the noise signal and a loudness in at least one critical band for the noise signal based on the distribution of sones/bark versus bark, the loudness profile comprising the overall loudness of the noise signal and the loudness in at least one critical band.

29. The electronic device of Claim 28, wherein the means for generating the alert signal comprises:

means for determining a power value for the alert signal based on the loudness
5 profile for the noise signal;

means for determining a transfer function for an alert signal transmit filter based on the loudness profile for the noise signal; and

means for transmitting the alert signal at the power value using the alert signal transmit filter.

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30. An electronic device, comprising:

means for providing a plurality of alert profiles;

means for receiving a user selection of one of the plurality of alert profiles; and

15 means for generating an alert signal that is based on the selected one of the plurality of alert profiles.

31. An electronic device, comprising:

means for providing a plurality of alert profiles;

means for receiving a noise signal;

20 means for selecting one of the plurality of alert profiles responsive to receiving the noise signal; and

means for generating an alert signal that is based on the selected one of the plurality of alert profiles.

25 32. A computer program product for operating an electronic device, comprising:

a computer readable storage medium having computer readable program code embodied therein, the computer readable program code comprising:

computer readable program code configured to receive a noise signal;

30 computer readable program code configured to generate a sound metric for the noise signal; and

computer readable program code configured to generate an alert signal based on the sound metric.

33 The computer program product of Claim 32, wherein the computer readable program code configured to generate the alert signal comprises:

5 computer readable program code configured to generate the alert signal having a spectral composition that is based on the sound metric.

34. The computer program product of Claim 33, wherein the sound metric is a loudness profile and wherein the computer readable program code configured to generate the sound metric comprises:

10 computer readable program code configured to perform a Fourier transform on the noise signal to obtain a frequency domain representation of the noise signal.

35. The computer program product of Claim 34, wherein the computer readable program code configured to generate the sound metric further comprises:

15 computer readable program code configured to calculate a distribution of sones/bark versus bark for the frequency domain representation of the noise signal using an ISO 532B loudness calculation method; and

computer readable program code configured to determine an overall loudness for the noise signal and a loudness in at least one critical band for the noise signal
20 based on the distribution of sones/bark versus bark, the loudness profile comprising the overall loudness of the noise signal and the loudness in at least one critical band.

36. The computer program product of Claim 35, wherein the computer readable program code configured to generate the alert signal comprises:

25 computer readable program code configured to determine a power value for the alert signal based on the loudness profile for the noise signal;

computer readable program code configured to determine a transfer function for an alert signal transmit filter based on the loudness profile for the noise signal; and

30 computer readable program code configured to transmit the alert signal at the power value using the alert signal transmit filter.

37. A computer program product for operating an electronic device, comprising:

a computer readable storage medium having computer readable program code embodied therein, the computer readable program code comprising:

computer readable program code configured to provide a plurality of alert profiles;

5 computer readable program code configured to receive a user selection of one of the plurality of alert profiles; and

computer readable program code configured to generate an alert signal that is based on the selected one of the plurality of alert profiles.

10 38. A computer program product for operating an electronic device, comprising:

a computer readable storage medium having computer readable program code embodied therein, the computer readable program code comprising:

15 computer readable program code configured to provide a plurality of alert profiles;

computer readable program code configured to receive a noise signal;

computer readable program code configured to select one of the plurality of alert profiles responsive to receiving the noise signal; and

20 computer readable program code configured to generate an alert signal that is based on the selected one of the plurality of alert profiles.